CAUTION
BEFORE SERVICING THE CHASSIS,
READ THE SAFETY PRECAUTIONS IN THIS MANUAL.
CONTENTS

CONTENTS ........................................................................................................... 2
PRODUCT SAFETY ............................................................................................... 3
SPECIFICATION ................................................................................................. 6
ADJUSTMENT INSTRUCTION .............................................................................. 9
BLOCK DIAGRAM ................................................................................................. 15
EXPLODED VIEW ................................................................................................. 16
SCHEMATIC CIRCUIT DIAGRAM ...........................................................................
SAFETY PRECAUTIONS

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by △ in the Schematic Diagram and Exploded View. It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent Shock, Fire, or other Hazards. Do not modify the original design without permission of manufacturer.

General Guidance

An isolation Transformer should always be used during the servicing of a receiver whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks.

It will also protect the receiver and its components from being damaged by accidental shorts of the circuitry that may be inadvertently introduced during the service operation.

If any fuse (or Fusible Resistor) in this TV receiver is blown, replace it with the specified.

When replacing a high wattage resistor (Oxide Metal Film Resistor, over 1 W), keep the resistor 10 mm away from PCB.

Keep wires away from high voltage or high temperature parts.

Before returning the receiver to the customer,

always perform an AC leakage current check on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

Leakage Current Cold Check(Antenna Cold Check)

With the instrument AC plug removed from AC source, connect an electrical jumper across the two AC plug prongs. Place the AC switch in the on position, connect one lead of ohm-meter to the AC plug prongs tied together and touch other ohm-meter lead in turn to each exposed metallic parts such as antenna terminals, phone jacks, etc.

If the exposed metallic part has a return path to the chassis, the measured resistance should be between 1 MO and 5.2 MO. When the exposed metal has no return path to the chassis the reading must be infinite.

An other abnormality exists that must be corrected before the receiver is returned to the customer.

Leakage Current Hot Check (See below Figure)

Plug the AC cord directly into the AC outlet.

Do not use a line Isolation Transformer during this check. Connect 1.5 K / 10 watt resistor in parallel with a 0.15 uF capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.

Measure the AC voltage across the resistor using AC voltmeter with 1000 ohms/volt or more sensitivity.

Reverse plug the AC cord into the AC outlet and repeat AC voltage measurements for each exposed metallic part. Any voltage measured must not exceed 0.75 volt RMS which is corresponds to 0.5 mA.

In case any measurement is out of the limits specified, there is possibility of shock hazard and the set must be checked and repaired before it is returned to the customer.

Leakage Current Hot Check circuit

When 25A is impressed between Earth and 2nd Ground for 1 second, Resistance must be less than 0.1 Ω

*Base on Adjustment standard
General Servicing Precautions

1. Always unplug the receiver AC power cord from the AC power source before:
   a. Removing or reinstalling any component, circuit board module or any other receiver assembly.
   b. Disconnecting or reconnecting any receiver electrical plug or other electrical connection.
   c. Connecting a test substitute in parallel with an electrolytic capacitor in the receiver.
      **CAUTION:** A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.

2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage measuring device (DVM, FETVOM, etc) equipped with a suitable high voltage probe. Do not test high voltage by "drawing an arc".

3. Do not spray chemicals on or near this receiver or any of its assemblies.

4. Unless specified otherwise in this service manual, clean electrical contacts only by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable non-abrasive applicator; 10 % (by volume) Acetone and 90 % (by volume) isopropyl alcohol (90 % - 99 % strength)
   **CAUTION:** This is a flammable mixture. Unless specified otherwise in this service manual, lubrication of contacts is not required.

5. Do not defeat any plug/socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.

6. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.

7. Always connect the test receiver ground lead to the receiver chassis ground before connecting the test receiver positive lead.

8. Use with this receiver only the test fixtures specified in this service manual.
   **CAUTION:** Do not connect the test fixture ground strap to any heat sink in this receiver.

Electrostatically Sensitive (ES) Devices

Some semiconductor (solid-state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed to prevent potential shock reasons prior to applying power to the unit under test.

2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.

3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.

4. Use only an anti-static type solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.

5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.

6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it.
   (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material)

7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   **CAUTION:** Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

General Soldering Guidelines

1. Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range of 500 °F to 600 °F.

2. Use an appropriate gauge of RMA resin-core solder composed of 60 parts tin/40 parts lead.

3. Thoroughly clean the surfaces to be soldered. Use a mall wire-bristle (0.5 inch, or 1.25 cm) brush with a metal handle.

4. Do not use freon-propelled spray-on cleaners.

5. Use the following unsoldering technique
   a. Allow the soldering iron tip to reach normal temperature.
   b. Heat the component lead until the solder melts.
   c. Quickly draw the melted solder with an anti-static, suction-type solder removal device or with solder braid.
      **CAUTION:** Work quickly to avoid overheating the circuit board printed foil.

6. Use the following soldering technique.
   a. Allow the soldering iron tip to reach a normal temperature (500 °F to 600 °F)
   b. First, hold the soldering iron tip and solder the strand against the component lead and the printed circuit foil, and hold it there only until the solder flows onto and around both the component lead and the foil.
      **CAUTION:** Work quickly to avoid overheating the circuit board printed foil.
   c. Closely inspect the solder area and remove any excess or splashed solder with a small wire-bristle brush.
IC Remove/Replacement
Some chassis circuit boards have slotted holes (oblong) through which the IC leads are inserted and then bent flat against the circuit foil. When holes are the slotted type, the following technique should be used to remove and replace the IC. When working with boards using the familiar round hole, use the standard technique as outlined in paragraphs 5 and 6 above.

Removal
1. Desolder and straighten each IC lead in one operation by gently prying up on the lead with the soldering iron tip as the solder melts.
2. Draw away the melted solder with an anti-static suction-type solder removal device (or with solder braid) before removing the IC.

Replacement
1. Carefully insert the replacement IC in the circuit board.
2. Carefully bend each IC lead against the circuit foil pad and solder it.
3. Clean the soldered areas with a small wire-bristle brush.
   (It is not necessary to reapply acrylic coating to the areas).

"Small-Signal" Discrete Transistor
Removal/Replacement
1. Remove the defective transistor by clipping its leads as close as possible to the component body.
2. Bend into a "U" shape the end of each of three leads remaining on the circuit board.
3. Bend into a "U" shape the replacement transistor leads.
4. Connect the replacement transistor leads to the corresponding leads extending from the circuit board and crimp the "U" with long nose pliers to insure metal to metal contact then solder each connection.

Power Output, Transistor Device
Removal/Replacement
1. Heat and remove all solder from around the transistor leads.
2. Remove the heat sink mounting screw (if so equipped).
3. Carefully remove the transistor from the heat sink of the circuit board.
4. Insert new transistor in the circuit board.
5. Solder each transistor lead, and clip off excess lead.
6. Replace heat sink.

Diode Removal/Replacement
1. Remove defective diode by clipping its leads as close as possible to diode body.
2. Bend the two remaining leads perpendicular y to the circuit board.
3. Observing diode polarity, wrap each lead of the new diode around the corresponding lead on the circuit board.
4. Securely crimp each connection and solder it.
5. Inspect (on the circuit board copper side) the solder joints of the two "original" leads. If they are not shiny, reheat them and if necessary, apply additional solder.

Fuse and Conventional Resistor
Removal/Replacement
1. Clip each fuse or resistor lead at top of the circuit board hollow stake.
2. Securely crimp the leads of replacement component around notch at stake top.
3. Solder the connections.
   CAUTION: Maintain original spacing between the replaced component and adjacent components and the circuit board to prevent excessive component temperatures.

Circuit Board Foil Repair
Excessive heat applied to the copper foil of any printed circuit board will weaken the adhesive that bonds the foil to the circuit board causing the foil to separate from or "lift-off" the board. The following guidelines and procedures should be followed whenever this condition is encountered.

At IC Connections
To repair a defective copper pattern at IC connections use the following procedure to install a jumper wire on the copper pattern side of the circuit board. (Use this technique only on IC connections).
1. Carefully remove the damaged copper pattern with a sharp knife. (Remove only as much copper as absolutely necessary).
2. Carefully scratch away the solder resist and acrylic coating (if used) from the end of the remaining copper pattern.
3. Bend a small "U" in one end of a small gauge jumper wire and carefully crimp it around the IC pin. Solder the IC connection.
4. Route the jumper wire along the path of the out-away copper pattern and let it overlap the previously scraped end of the good copper pattern. Solder the overlapped area and clip off any excess jumper wire.

At Other Connections
Use the following technique to repair the defective copper pattern at connections other than IC Pins. This technique involves the installation of a jumper wire on the component side of the circuit board.
1. Remove the defective copper pattern with a sharp knife. Remove at least 1/4 inch of copper, to ensure that a hazardous condition will not exist if the jumper wire opens.
2. Trace along the copper pattern from both sides of the pattern break and locate the nearest component that is directly connected to the affected copper pattern.
3. Connect insulated 20-gauge jumper wire from the lead of the nearest component on one side of the pattern break to the lead of the nearest component on the other side. Carefully crimp and solder the connections.
   CAUTION: Be sure the insulated jumper wire is dressed so the it does not touch components or sharp edges.
NOTE: Specifications and others are subject to change without notice for improvement.

1. Application range
This specification is applied to the LCD TV used LD01U chassis.

2. Requirement for Test
Each part is tested as below without special appointment.

1) Temperature
   : 25 °C ± 5 °C (77 °F ± 9 °F), CST : 40 °C ± 5 °C
2) Relative Humidity : 65 % ± 10 %
3) Power Voltage
   : Standard input voltage (AC 100-240 V~ 50 / 60 Hz)
   * Standard Voltage of each products is marked by model.
4) Specification and performance of each parts are followed each drawing and specification by part number in accordance with BOM.
5) The receiver must be operated for about 5 minutes prior to the adjustment.

3. Test method
1) Performance: LGE TV test method followed
2) Demanded other specification
   - Safety: CE, IEC specification
   - EMC: CE, IEC

4. Model General Specification

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Specification</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Market</td>
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<td>DTV-T/C &amp; Analog (Germany, Netherlands, Switzerland, Hungary, Austria, Slovenia, Sweden, Denmark, Finland, Norway, Bulgaria)</td>
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<td></td>
<td></td>
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<td></td>
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</tr>
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<td></td>
<td>3) PAL-I/I'</td>
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</tr>
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<td>4) SECAM L/L'</td>
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<td></td>
<td>5) DVB-T/C/S (ID TV)</td>
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<td>Receiving system</td>
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<td></td>
<td>Digital : COFDM, QAM</td>
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<td>Scart Jack is Full scart and support RF-OUT (analog &amp; DTV)</td>
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<td>RGB Input</td>
<td>RGB-PC</td>
<td>Analog(D-SUB 15PIN)</td>
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<td>HDMI Input (3EA)</td>
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<td>PC(HDMI version 1.3)</td>
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<td>HDMy2-DTV</td>
<td>Support HDCP</td>
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<td>HDMy3-DTV</td>
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<td>DVB-S</td>
<td>CI+ : Germany(Astra HD+)</td>
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6. Component Video Input (Y, Cb/Pb, Cr/Pr)

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<td>Resolution</td>
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</tr>
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7. RGB (PC)

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### 8. HDMI Input

#### (1) DTV Mode

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<th>V-freq.(Hz)</th>
<th>Pixel clock(MHz)</th>
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#### (2) PC Mode

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<th>Remark</th>
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<td>3.</td>
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<td>4.</td>
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<td>65.00</td>
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<td>HDCP/FHD model</td>
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ADJUSTMENT INSTRUCTION

1. Application Range
This specification sheet is applied to all of the LCD TV with LD01U chassis.

2. Designation
1) The adjustment is according to the order which is designated and which must be followed, according to the plan which can be changed only on agreeing.
2) Power Adjustment: Free Voltage
3) Magnetic Field Condition: Nil.
4) Input signal Unit: Product Specification Standard
5) Reserve after operation: Above 5 Minutes (Heat Run)
   - Temperature : at 25 °C ± 5 °C
   - Relative humidity : 65 % ± 10 %
   - Input voltage : 220 V, 60 Hz
6) Adjustment equipments: Color Analyzer(CA-210 or CA-110), DDC Adjustment Jig equipment, Service remote control.
7) Push The “IN STOP” key - For memory initialization.

3. Main PCB check process
   * APC - After Manual-Insult, executing APC
   * Boot file Download
5) Click “Auto” tab and set as below
6) Click “Run”.
7) After downloading, check “OK” message.

   Case1 : Software version up
   1. After downloading S/W by USB, TV set will reboot automatically
   2. Push “In-stop” key
   3. Push “Power on” key
   4. Function inspection
   5. After function inspection, Push “In-stop” key.

   Case2 : Function check at the assembly line
   1. When TV set is entering on the assembly line, Push “In-stop” key at first.
   2. Push “Power on” key for turning it on.
   -> If you push “Power on” key, TV set will recover channel information by itself.
   3. After function inspection, Push “In-stop” key.

   * USB DOWNLOAD
   1) Put the USB Stick to the USB socket
   2) Automatically detecting update file in USB Stick
      - If your downloaded program version in USB Stick is Low, it didn’t work. But your downloaded version is High, USB data is automatically detecting
   3) Show the message “Copying files from memory”
4) Updating is staring.

5) Uploading completed, The TV will restart automatically.

6) If your TV is turned on, check your updated version and Tool option. (explain the Tool option, next stage)

   * If downloading version is more high than your TV have, TV can lost all channel data. In this case, you have to channel recover. if all channel data is cleared, you didn’t have a DTV/ATV test on production line.

   * After downloading, have to adjust Tool Option again.
     1) Push "IN-START" key in service remote controller
     2) Select “Tool Option 1” and Push “OK” button.
     3) Punch in the number. (Each model has their number)

   Module | Tool option1 | Tool option2 | Tool option3 | Tool option4 | Tool option5
   AUO | 17982 | 10794 | 51209 | 26904 | 290

4) Completed selecting Tool option.

3.1. ADC Process

(1) ADC
- Enter Service Mode by pushing “ADJ” key,
- Enter Internal ADC mode by pushing ►" key at “5. ADC Calibration”

<Caution> Using ‘power on’ button of the Adjustment R/C, power on TV.

* ADC Calibration Protocol (RS232)

Adjust Sequence

<table>
<thead>
<tr>
<th>Item</th>
<th>CMD1</th>
<th>CMD2</th>
<th>Data0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjust Mode In</td>
<td>A</td>
<td>A</td>
<td>0</td>
</tr>
</tbody>
</table>

   When transfer the ‘Mode In’, Carry the command.

| ADC Adjust | A | D | 1 | 0 |

   Automatically adjustment (The use of a internal pattern)

   • xb 00 40 [Component1 Input (480i)]
   • ad 00 10 [Adjust 480i Comp1]
   • xb 00 60 [RGB Input (1024*768)]
   • ad 00 10 [Adjust 1024*768 RGB]
   • aa 00 90 End Adjust mode

   * Required equipment : Adjustment R/C.

3.2. Function Check

* Check display and sound
  - Check Input and Signal items. (cf. work instructions)
  1) TV
  2) AV (SCART1/SCART2/CVBS)
  3) COMPONENT (480i)
  4) RGB (PC : 1024 x 768 @ 60 Hz)
  5) HDMI
  6) PC Audio In

   * Display and Sound check is executed by Remote control.
4. Total Assembly line process
4.1. Adjustment Preparation

· W/B Equipment condition
  CA210:
  - CCFL/EEFL -> CH9, Test signal: Inner pattern (80IRE)
  - LED -> CH14, Test signal: Inner pattern (80IRE)

· Above 5 minutes H/run in the inner pattern. (“power on” key of adjust remote control)
  - Edge LED W/B Table is process of time (Only LGD Module)
    CA210: CH14, Test signal: Inner pattern (80IRE)

** Connecting picture of the measuring instrument (On Automatic control)**
Inside PATTERN is used when W/B is controlled. Connect to auto controller or push Adjustment R/C POWER ON -> Enter the mode of White-Balance, the pattern will come out.

** Auto-control interface and directions**
1) Adjust in the place where the influx of light like floodlight around is blocked. (illumination is less than 10 lux).
2) Adhere closely the Color Analyzer (CA210) to the module less than 10 cm distance, keep it with the surface of the Module and Color Analyzer’s prove vertically. (80° ~ 100°).
3) Aging time
   - After aging start, keep the power on (no suspension of power supply) and heat-run over 5 minutes.
   - Using ‘no signal’ or ‘full white pattern’ or the others, check the back light on.

** Caution **
Color Temperature : COOL, Medium, Warm.
One of R Gain/G Gain/ B Gain should be kept on 0xC0, and adjust other two lower than C0.
(when R/G/B Gain are all C0, it is the FULL Dynamic Range of Module)

  - After enter Service Mode by pushing “ADJ” key,
  - Enter White Balance by pushing "G" key at “6. White Balance”.

* After you finished all adjustments, Press “In-start” key and compare Tool option and Area option value with its BOM, if it is correctly same then unplug the AC cable. If it is not same, then correct it same with BOM and unplug AC cable. For correct it to the model’s module from factory Jig model.
  - Push the “IN STOP” key after completing the function inspection. And Mechanical Power Switch must be set “ON”.

4.2. DDC EDID Write (RGB 128Byte )
  - Connect D-sub Signal Cable to D-sub Jack.
  - Write EDID Data to EEPROM (24C02) by using DDC2B protocol.
  - Check whether written EDID data is correct or not.
  - For SVC main Assembly, EDID have to be downloaded to Insert Process in advance.

4.3. DDC EDID Write (HDMI 256Byte)
  - Connect HDMI Signal Cable to HDMI Jack.
  - Write EDID Data to EEPROM (24C02) by using DDC2B protocol.
  - Check whether written EDID data is correct or not.
  - For SVC main Assembly, EDID have to be downloaded to Insert Process in advance.
4.4. EDID DATA

1) All Data : HEXA Value
2) Changeable Data :
   *: Serial No : Controlled / Data:01
   **: Month : Controlled / Data:00
   ***: Year : Controlled
   ****: Check sum

- Auto Download
  • After enter Service Mode by pushing “ADJ” key,
  • Enter EDID D/L mode.
  • Enter “START” by pushing “OK” key.

  * Caution : Never connect HDMI & D-sub Cable when EDID download
  * Edid data and Model option download (RS232)

- Manual Download
  * Caution
  1) Use the proper signal cable for EDID Download.
     - Analog EDID : Pin3 exists
     - Digital EDID : Pin3 exists
  2) Never connect HDMI & D-sub Cable at the same time.
  3) Use the proper cables below for EDID Writing.
  4) Download HDMI1, HDMI2, separately because HDMI1 is different from HDMI2.

- 1) HD RGB EDID data

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<thead>
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<th>Item</th>
<th>CMD1</th>
<th>CMD2</th>
<th>Data0</th>
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<tr>
<td>Download</td>
<td>A</td>
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</tr>
<tr>
<td>'Mode In'</td>
<td>A</td>
<td>E</td>
<td>00</td>
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</table>
When transfer the ‘Mode In’, Carry the command.
Automatically Download (The use of a internal pattern)

2) HD HDMI EDID data

- Serial No: Controlled on production line.
- Month, Year: Week ; '01' -> '01'
  Year ; '2011' -> '15' fix
- Model Name(HEX): all

<table>
<thead>
<tr>
<th>Model Name</th>
<th>HEX</th>
<th>EDID Table</th>
<th>DDC Function</th>
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<tbody>
<tr>
<td>HD Model</td>
<td>0000</td>
<td>00 00</td>
<td>Analog/Digital</td>
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</tbody>
</table>

- Input MODE | MODEL NAME(HEX) |
<table>
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<tr>
<td>HDMI1</td>
<td>65030C001000</td>
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<tr>
<td>HDMI2</td>
<td>65030C002000</td>
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<tr>
<td>HDMI3</td>
<td>65030C003000</td>
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</tbody>
</table>

* Detail EDID Options are below

- Product ID

- Serial No: Controlled on production line.
- Month, Year: Week ; '01' -> '01'
  Year ; '2011' -> '15' fix
- Model Name(HEX): all

- Checksum: Changeable by total EDID data.
- Vendor Specific(HDMI)
4.5. V-COM Adjust(Only LGD(M+S) Module)

- Why need Vcom adjustment?
  
  The Vcom (Common Voltage) is a Reference Voltage of Liquid Crystal Driving.
  
  -> Liquid Crystal need for Polarity Change with every frame.

- Adjust sequence
  
  · Press the PIP key of the ADJ remote control. (This PIP key is hot key to enter the VCOM adjusting mode)
  
  (Or After enter Service Mode by pushing “ADJ” key, then Enter V-Com Adjust mode by pushing “G” key at “10. V-Com”)
  
  · As pushing the right or the left key on the remote control, and find the V-COM value which is no or minimized the Flicker. (If there is no flicker at default value, Press the exit key and finish the VCOM adjustment.)
  
  · Push the “OK” key to store value. Then the message “Saving OK” is pop.
  
  · Press the exit key to finish VCOM adjustment.

(Visual Adjust and control the Voltage level)

4.6. Outgoing condition Configuration

- When pressing IN-STOP key by SVC remocon, Red LED are blinked alternatively. And then Automatically turn off.
  (Must not AC power OFF during blinking)

4.7. Hi-pot Test

Confirm whether is normal or not when between power board’s ac block and GND is impacted on 1.5 kV(dc) or 2.2 kV(dc) for one second.

5. Model name & Serial number D/L

- Press “Power on” key of service remocon.
  (Baud rate : 115200 bps)
- Connect RS232 Signal Cable to RS-232 Jack.
- Write Serial number by use RS-232.
- Must check the serial number at the Diagnostics of SET UP menu. (Refer to below).

5.1. Signal TABLE

<table>
<thead>
<tr>
<th>No.</th>
<th>Adj mode</th>
<th>CMD(hex)</th>
<th>LENGTH(hex)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>EEPROM WRITE</td>
<td>A0h</td>
<td>84h+n</td>
<td>n-bytes Write(n=1–16)</td>
</tr>
</tbody>
</table>

* Description
  
  FOS Default write : <7mode data> write Vtotal, V_Frequency, Sync_Polarity, Htotal, Hstart, Vstart, 0, Phase
  
  Data write : Model Name and Serial Number write in EEPROM.

5.2. Command Set

- 1. EEPROM WRITE

5.3. Method & notice

A. Serial number D/L is using of scan equipment.
B. Setting of scan equipment operated by Manufacturing Technology Group.
C. Serial number D/L must be conformed when it is produced in production line, because serial number D/L is mandatory by D-book 4.0.
Manual Download (Model Name and Serial Number)

If the TV set is downloaded by OTA or Service man, Sometimes model name or serial number is initialized.(Not always)
There is impossible to download by bar code scan, so It need Manual download.

1) Press the 'instart' key of ADJ remote controller.
2) Go to the menu 5.Model Number D/L’ like below photo.
3) Input the Factory model name(ex 42LD450-ZA) or Serial number like photo.
4) Check the model name Instart menu -> Factory name displayed (ex 42LD450-ZA)
5) Check the Diagnostics (DTV country only) -> Buyer model displayed (ex 42LD450)

6. CI+ Key Download method

   (1) Download Procedure
   1) Press "Power on" button of a service remote control. (Baud rate : 115200 bps)
   2) Connect RS232-C Signal Cable.
   3) Write CI+ Key through RS-232-C.
   4) Check whether the key was downloaded or not at 'In Start' menu. (Refer to below).

    => Check the Download to CI+ Key value in LGset.
    1. check the method of CI+ Key value
       a. check the method of Instart menu
       b. check the method of RS232C Command
          1) into the main ass'y mode (RS232 : aa 00 00)

          | CMD 1 | CMD 2 | Data 0 |
          |-------|-------|--------|
          | A     | A     | 0 0    |

          2) check the key download for transmitted command (RS232 : ci 00 10)

          | CMD 1 | CMD 2 | Data 0 |
          |-------|-------|--------|
          | C     | i     | 1 0    |

          3) Result value
             - normally status for download : Okx
             - abnormally status for download : Ngx

    2. Check the method of CI+ Key value (RS232)
       1) into the main ass'y mode (RS232 : aa 00 00)

       | CMD 1 | CMD 2 | Data 0 |
       |-------|-------|--------|
       | A     | A     | 0 0    |

       2) Check the method of CI+ key by command (RS232 : ci 00 20)

       | CMD 1 | CMD 2 | Data 0 |
       |-------|-------|--------|
       | C     | i     | 2 0    |

    3) Result value
       i 01 OK 1dd1852d21c1ed5dcx

7. Local Dimming Function Check

   Step1) Turn on TV.
   Step2) Press “P-only” key, entrance to power only mode and Press “Exit” key
   Step3) Press “Tilt” key, entrance to Local Dimming mode.
   Step4) At the Local Dimming mode, module Edge Backlight moving right to left Back light of module moving
   Step5) confirm the Local Dimming mode
   Step6) Press “Exit” key
EXPLODED VIEW

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by △ in the Schematic Diagram and EXPLODED VIEW. It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent X-RADIATION, Shock, Fire, or other Hazards. Do not modify the original design without permission of manufacturer.
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURED SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.
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SIDE CVBS PHONE JACK
(New Item Development)

SIDE COMPONENT PHONE JACK
(New Item Development)
SMD GASKET

THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IS ESSENTIAL THAT ONLY MANUFACTURED SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.
LCD TV Repair Guide
`11 years New Basic Models

Contents

1. Product Roadmap
2. Main PCB layout
3. Block Diagram
4. Interconnection
5. Standard Repair Process

LCD TV EU Group
LCD TV Research Department

JAN. 28th, 2011
Overview for ’11 Year Model

LCD TV Repair Guide
`11 years New Models

< Applicable Basic Model >
xxLK330, xxLK430, xxLK450, xxLK530, xxLK550
xxLV2300, xxLV2500, xxLV2540, xxLV3400
xxLV3500, xxLV3550, xxLV5500, xxLV4500
xxLW4500 (3D)
## Product Roadmap

### Lamp

<table>
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<tr>
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<th>Pan EU</th>
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<th>Nordic(N)</th>
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### Edge LED

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<td></td>
<td>47LV4550-ZB</td>
<td>47LV4550U-ZB</td>
<td>47LV4550N-ZB</td>
<td>47LV4550A-ZB</td>
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<tr>
<td>LW45</td>
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<td>32LV5400U-ZB</td>
<td>32LV5400N-ZB</td>
<td>32LV5400A-ZB</td>
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<td>42LV5400N-ZB</td>
<td>42LV5400A-ZB</td>
</tr>
<tr>
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<td>47LV5400-ZB</td>
<td>47LV5400U-ZB</td>
<td>47LV5400N-ZB</td>
<td>47LV5400A-ZB</td>
</tr>
<tr>
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<td>32LV5450U-ZB</td>
<td>32LV5450N-ZB</td>
<td>32LV5450A-ZB</td>
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<td>42LV5450U-ZB</td>
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<td>42LV5450A-ZB</td>
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<td>47LV5450U-ZB</td>
<td>47LV5450N-ZB</td>
<td>47LV5450A-ZB</td>
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### 3D LED

<table>
<thead>
<tr>
<th>Tool</th>
<th>Pan EU</th>
<th>UK(U)</th>
<th>Nordic(N)</th>
<th>Italy(A)</th>
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<tbody>
<tr>
<td>LV55</td>
<td>22LV5500-ZC</td>
<td>22LV5500U-ZC</td>
<td>22LV5500N-ZC</td>
<td>22LV5500A-ZC</td>
</tr>
<tr>
<td></td>
<td>26LV5500-ZC</td>
<td>26LV5500U-ZC</td>
<td>26LV5500N-ZC</td>
<td>26LV5500A-ZC</td>
</tr>
<tr>
<td></td>
<td>32LV5500-ZC</td>
<td>32LV5500U-ZC</td>
<td>32LV5500N-ZC</td>
<td>32LV5500A-ZC</td>
</tr>
<tr>
<td></td>
<td>42LV5500-ZC</td>
<td>42LV5500U-ZC</td>
<td>42LV5500N-ZC</td>
<td>42LV5500A-ZC</td>
</tr>
<tr>
<td></td>
<td>47LV5500-ZC</td>
<td>47LV5500U-ZC</td>
<td>47LV5500N-ZC</td>
<td>47LV5500A-ZC</td>
</tr>
</tbody>
</table>

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Main PCB

19/22/26LV2500 (50HZ)

1. Main processor, DDR Memory, Flash Memory
2. Micom for Key/IR sensing
3. Audio AMP (5W+5W)

* 19/22/26LV2500_S7 Reused ('11)
Main IC : LGE101_Mstar
Tuner Type : TDTJ-S001D (DVB-T/C)
Display Type (Resolution) : LED TV (1366 x 768)
Interface : HDMI 2EA, Component 1EA, AV 1EA, USB 1EA
Difference : Without FRC, HDMI Position, Resolution, Interface, Wafer Position (Sub)
Main PCB

22/26LK330 (50HZ)

* 22/26LK330_S7 Reused ('11)
Main IC : LGE101_Mstar
Tuner Type : TDTJ-S001D (DVB-T/C)
Display Type (Resolution) : LCD TV (1366 x 768)
Interface : HDMI 2EA, Component 1EA, AV 1EA, USB 1EA
Difference : Without FRC, HDMI Position, Resolution, Interface, Wafer Position (Sub)
Main PCB

32/37/42/47LK450 (50HZ)

- Main processor, DDR Memory
- Flash Memory
- Micom for Key/IR sensing
- Audio AMP (10W+10W)

* 32/37/42/47LK450_S7 Reused ('11)
Main IC : LGE101_Mstar
Tuner Type : TDTJ-S001D (DVB-T/C)
Display Type (Resolution) : LCD TV (1920 x 1080)
Interface : HDMI 3EA, Component 1EA, AV 1EA, USB 1EA
Difference : Without FRC, HDMI Position, Resolution, Interface, Wafer Position (Sub)
Main PCB

32/37/42/47/55LW4500 (100HZ)

- Main processor, DDR Memory
- Flash Memory
- Micom for Key/IR sensing
- Audio AMP (10W+10W)
- LED Driver connection (with local dimming)

* 37LW4500_S7 Reused (*'11)
Main IC : LGE107_Mstar
Tuner Type : TDTJ-S001D (DVB-T/C)
Display Type (Resolution) : 3D, LED TV (1920 x 1080)
Interface : HDMI 3EA, Component 1EA, AV 1EA, USB 1EA
Difference : HDMI Position, Interface, Wafer Position (LVDS, Power, Sub)
Interconnection - 1

19/22LV2500

[PCBs]
1 Main PCB
2 Soft Touch Key/IR PCB

[Cables]
1 Soft Touch key/IR cable
2 Main / Module LVDS cable
3 LED driver / Module cable
4 SPK cable

LCD Module
Interconnection - 2

19/22LV5500

[PCBs]
1 Main PCB
2 Soft Touch Key/IR PCB

[Cables]
1 Soft Touch key/IR cable
2 Main / Module LVDS cable
3 LED driver / Module cable
4 SPK cable

LCD Module
Interconnection - 3

26LV2500

[PCBs]
1. Main PCB
2. Soft Touch Key/IR PCB

[Cables]
1. Soft Touch key/IR cable
2. Main / Module LVDS cable
3. LED driver / Module cable
4. SPK cable
Interconnection - 4

26LV5500

[PCBs]
1 Main PCB
2 Soft Touch Key/IR PCB

[Cables]
1 Soft Touch key/IR cable
2 Main / Module LVDS cable
3 LED driver / Module cable
4 SPK cable

LED driver

Main PCB

Soft Touch Key/IR PCB

Main / Module LVDS cable

LED driver / Module cable

SPK cable

LCD Module
Interconnection - 5

[PCBs]
1 Main PCB
2 PSU
3 Soft Touch Key/IR PCB
4 Timing controller
5 LED Driver

[Cables]
1 Main / PSU cable
2 Main / Module LVDS cable
3 LED driver / Module cable
4 SPK cable
5 Soft Touch key/IR cable
6 LED driver / PSU cable 14P
37LV3400

[PCBs]
1 Main PCB
2 PSU
3 Soft Touch Key/IR PCB
4 Timing controller
5 LED Driver

[Cables]
1 Main / PSU cable
2 Main / Module LVDS cable
3 LED driver / Module cable
4 SPK cable
5 Soft Touch key/IR cable
6 LED driver / PSU cable 14P
Interconnection - 7

37LV3550

[PCBs]
1 Main PCB
2 PSU
3 Soft Touch Key/IR PCB
4 Timing controller
5 LED Driver

[Cables]
1 Main / PSU cable
2 Main / Module LVDS cable
3 LED driver / Module cable
4 SPK cable
5 Soft Touch key/IR cable
6 LED driver / PSU cable 14P
Interconnection - 8

42LV4500

[PCBs]
1. Main PCB
2. PSU + LED driver
3. Soft Touch Key/IR PCB
4. Timing controller

[Cables]
1. Main / PSU cable
2. Main / Module LVDS cable
3. LED driver / Module cable
4. SPK cable
5. Soft Touch key/IR cable

LCD Module
Interconnection - 9

### [PCBs]
1. Main PCB
2. PSU + LED driver
3. Soft Touch Key/IR PCB
4. Timing controller

### [Cables]
1. Main / PSU cable
2. Main / Module LVDS cable
3. LED driver / Module cable
4. SPK cable
5. Soft Touch key/IR cable
6. Local dimming signal cable (Main / LED driver 8pin)
Interconnection - 11

37LK430

[PCBs]
1. Main PCB
2. PSU (without inverter)
3. IR & Indicator PCB
4. Local Key PCB
5. Timing controller

[Cables]
1. Main / PSU cable
2. Main / Module LVDS cable
3. SPK cable
4. IR/Local key cable

LCD Module
Interconnection - 12

42LK450

[PCBs]
1 Main PCB
2 PSU (without inverter)
3 Soft Touch Key/IR PCB
4 Inverter
5 Timing controller

[Cables]
1 Main / PSU cable
2 Main / Module LVDS cable
3 SPK cable
4 Soft Touch key/IR cable
5 Inverter/PSU cable (14pin)
Interconnection – sub PCB (LV**/LK450 Series)

Soft Touch Key/IR PCB

SPK unit

15pin Cable

To Main
Interconnection – sub PCB (LK430/LK530 Series)

- Tact key
- IR/Sensor
- SPK unit
- 12pin Cable
- To Main
## Contents of LCD TV Standard Repair Process

<table>
<thead>
<tr>
<th>No.</th>
<th>Error symptom (High category)</th>
<th>Error symptom (Mid category)</th>
<th>Page</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A. Video error</td>
<td>No video/Normal audio</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>No video/No audio</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Video error, video lag/stop</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Color error</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Vertical/Horizontal bar, residual image, light spot, external device color error</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>B. Power error</td>
<td>No power</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Off when on, off while viewing, power auto on/off</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>C. Audio error</td>
<td>No audio/Normal video</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>Wrecked audio/discontinuation/noise</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>D. Function error</td>
<td>No response in remote controller, key error, recording error, memory error</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>External device recognition error</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>E. Noise</td>
<td>Circuit noise, mechanical noise</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>F. Exterior error</td>
<td>Exterior defect</td>
<td>13</td>
<td></td>
</tr>
</tbody>
</table>

First of all, Check whether there is SVC Bulletin in GCSC System for these model.
First of all, Check whether all of cables between board is inserted properly or not.
(Main B/D ↔ Power B/D, LVDS Cable, Speaker Cable, IR B/D Cable,..)

- **A1**
  - No video
  - Normal audio
  - Y: Check Back Light
    - On with naked eye
  - N: Move to No video/No audio

- **A2**
  - Normal audio
  - Check Power Board 20V/12V or 24v output

- **A3**
  - Y: Replace Inverter or module
  - N: Repair Power Board or parts

- **A4**
  - Normal voltage
  - Y: Replace T-con Board or module
  - N: Repair Power Board or parts

※Precaution **A7 & A3**
Always check & record S/W Version and White Balance value before replacing the Main Board

- Replace Main Board
- Re-enter White Balance value
A. Video error

No video/ No audio

Check various voltages of Power Board (3.5V, 12V, 20V or 24V...)

Normal voltage?

Y

Check and replace MAIN B/D

N

Replace Power Board and repair parts

End
### A. Picture Problem

<table>
<thead>
<tr>
<th>Error symptom</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Picture broken/ Freezing</td>
<td>2010. 2.19</td>
<td>3/13</td>
</tr>
</tbody>
</table>

#### Standard Repair Process

<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>Established date</th>
<th>Revised date</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Picture broken/ Freezing</td>
<td>2010. 2.19</td>
<td>3/13</td>
</tr>
</tbody>
</table>

#### A6

**Check RF Signal level**

- By using Digital signal level meter
- By using Diagnostics menu on OSD (Menu → Red key → Signal test)
  - Signal strength (Normal: over 50%)
  - Signal Quality (Normal: over 50%)

**Y**

- Check RF Signal level
- **Check RF Cable Connection**
  1. Reconnection
  2. Install Booster

**N**

- Check RF Signal level
- **Check RF Cable Connection**
  1. Reconnection
  2. Install Booster

#### A7

**Normal Picture?**

- **Y**
  - Check S/W Version
    - **SVC Bulletin?**
      - **N**
        - Check Tuner soldering
          - **Y**
            - Normal Picture?
              - **Y**
                - Close
              - **N**
                - Replace Main B/D
        - **Y**
          - S/W Upgrade
            - **Y**
              - Normal Picture?
                - **Y**
                  - Close
                - **N**
                  - Close
          - **N**
            - Normal Picture?
              - **Y**
                - Close
              - **N**
                - Close
      - **N**
        - Normal Picture?
          - **Y**
            - Close
          - **N**
            - Check Tuner soldering
              - **Y**
                - Normal Picture?
                  - **Y**
                    - Close
                  - **N**
                    - Replace Main B/D
              - **N**
                - S/W Upgrade
                  - **Y**
                    - Normal Picture?
                      - **Y**
                        - Close
                      - **N**
                        - Replace Main B/D
                  - **N**
                    - Normal Picture?
                      - **Y**
                        - Close
                      - **N**
                        - Replace Main B/D
          - **N**
            - Normal Picture?
              - **Y**
                - Close
              - **N**
                - Replace Main B/D

**N**

- Check RF Signal level
- **Check RF Cable Connection**
  1. Reconnection
  2. Install Booster

#### Close

- By using Digital signal level meter
- By using Diagnostics menu on OSD (Menu → Red key → Signal test)
- Signal strength (Normal: over 50%)
- Signal Quality (Normal: over 50%)

**Y**

- Check RF Signal level
- **Check RF Cable Connection**
  1. Reconnection
  2. Install Booster

**N**

- Check RF Signal level
- **Check RF Cable Connection**
  1. Reconnection
  2. Install Booster
**A8**
Check color by input
- External Input
- COMPONENT
- RGB
- HDMI/DVI

**A10/A11**

- Check and replace Link Cable (LVDS) and contact condition

```
Color error?
Y
Replace Main B/D
N
End
```

**A12**
Check Test pattern

- External Input/Component error

```
External device/Cable normal
Y
Replace Main B/D
N
Request repair for external device/cable
```

- RGB/HDMI/DVI error

```
Check external device and cable
Y
Replace Main B/D
N
```

- Check error color input mode

```
Check color by input
- External Input
- COMPONENT
- RGB
- HDMI/DVI
```

- Check error color input mode

```
Y
Replace Main B/D
N
End
```
## Standard Repair Process

### LCD TV

#### Error symptom
- Vertical / Horizontal bar, residual image, light spot, external device color error

#### Established date
- 2010. 2.19

#### Revised date
- 5/13

## A. Video error

### Vertical/Horizontal bar, residual image, light spot

**☞ A8**
Check color condition by input
- External Input
- Component
- RGB
- HDMI/DVI

**Screen normal?**
- Y: Check external device connection condition
  - N: Replace module

**Normal?**
- Y: Check and replace Link Cable
  - N: Replace Main B/D

**Replace Module**

**☞ A10/ A11**
Check Test pattern

**Screen normal?**
- Y: End
  - N: Request repair for external device

**End**

### External device screen error-Color error

**Check S/W Version**
- N: Check version
  - Y: S/W Upgrade

**Normal screen?**
- Y: End
  - N: Replace Main B/D

**Check screen condition by input**
- External Input
- Component
- RGB
- HDMI/DVI

**External Input error**
- Y: Connect other external device and cable (Check normal operation of External Input, Component, RGB and HDMI/DVI by connecting Jig, pattern Generator, Set-top Box etc.)
  - N: Request repair for external device

**Component error**
- Y: Connect other external device and cable (Check normal operation of External Input, Component, RGB and HDMI/DVI by connecting Jig, pattern Generator, Set-top Box etc.)
  - N: Replace Main B/D

**RGB error**
- Y: Connect other external device and cable (Check normal operation of External Input, Component, RGB and HDMI/DVI by connecting Jig, pattern Generator, Set-top Box etc.)
  - N: Replace Main B/D

**HDMI/DVI**
- Y: Connect other external device and cable (Check normal operation of External Input, Component, RGB and HDMI/DVI by connecting Jig, pattern Generator, Set-top Box etc.)
  - N: Replace Main B/D
B. Power error

- **No power**

**Power LED On?**
- **Y**
  - DC Power on by pressing Power Key On Remote control
    - Check Power On "High"
      - Normal operation?
        - **Y**
          - Check Power B/D
        - **N**
          - Replace Main B/D
    - **N**
      - Replace Power B/D
  - **N**
    - Replace Power B/D

**Check Power LED**
- **Y**
  - Check Power LED was inserted properly
  - Normal?
    - **Y**
      - Close
    - **N**
      - Replace Power B/D
- **N**
  - Replace Main B/D

**Stand-BY: Red**
**Operating: white**

*Editor's Note: The diagram includes flowchart steps for troubleshooting and repair processes for power errors in an LCD TV.*
B. Power error

Error symptom: Off when on, off while viewing, power auto on/off

<table>
<thead>
<tr>
<th>Status</th>
<th>Power off List</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&quot;POWEROFF_REMOTEKEY&quot;</td>
<td>Power off by REMOTE CONTROL</td>
</tr>
<tr>
<td></td>
<td>&quot;POWEROFF_OFFTIMER&quot;</td>
<td>Power off by OFF TIMER</td>
</tr>
<tr>
<td></td>
<td>&quot;POWEROFF_SLEEPTIMER&quot;</td>
<td>Power off by SLEEP TIMER</td>
</tr>
<tr>
<td></td>
<td>&quot;POWEROFF_INSTOP&quot;</td>
<td>Power off by INSTOP KEY</td>
</tr>
<tr>
<td></td>
<td>&quot;POWEROFF_AUTOOFF&quot;</td>
<td>Power off by AUTO OFF</td>
</tr>
<tr>
<td></td>
<td>&quot;POWEROFF_ONTIMER&quot;</td>
<td>Power off by ON TIMER</td>
</tr>
<tr>
<td></td>
<td>&quot;POWEROFF_RS232C&quot;</td>
<td>Power off by RS232C</td>
</tr>
<tr>
<td></td>
<td>&quot;POWEROFF_RESREC&quot;</td>
<td>Power off by Reserved Record</td>
</tr>
<tr>
<td></td>
<td>&quot;POWEROFF_RECEND&quot;</td>
<td>Power off by End of Recording</td>
</tr>
<tr>
<td></td>
<td>&quot;POWEROFF_SWDOWN&quot;</td>
<td>Power off by S/W Download</td>
</tr>
<tr>
<td>Abnormal</td>
<td>&quot;POWEROFF_ABNORMAL1&quot;</td>
<td>Power off by abnormal status except CPU trouble</td>
</tr>
<tr>
<td></td>
<td>&quot;POWEROFF_CPUABNORMAL&quot;</td>
<td>Power off by CPU Abnormal</td>
</tr>
</tbody>
</table>

* Please refer to the all cases which can be displayed on power off mode.
**Standard Repair Process**

<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>C. Audio error</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No audio/ Normal video</td>
<td>2010. 2.19</td>
<td>8/13</td>
</tr>
</tbody>
</table>

- **A24**: Check user menu > Speaker off
  - Off: N → Off
  - Off: Y → Cancel OFF

- **A25**: Check audio B+ 20V or 24V of Power Board
  - Normal voltage: Y → Replace Power Board and repair parts
  - Normal voltage: N → Disconnection

- **Disconnection**: N → Replace MAIN Board → End
  - Y → Replace Speaker
→ abnormal audio/discontinuation/noise is same after “Check input signal” compared to No audio

Check input signal
- RF
- External Input signal

Signal normal? Y N

(When RF signal is not received)
Request repair to external cable/ANT provider

(In case of External Input signal error)
Check and fix external device

Check audio B+ Voltage (20V or 24V)

Normal voltage? Y N

卓 A25

Check and replace speaker and connector

Replace Main B/D

Replace Power B/D

Replace Main B/D

End

Check and check other external device

Normal audio? Y N

Connect and check other external device

Check and fix external device
1. Remote control (R/C) operating error

Check R/C itself Operation

- Normal operating?:
  - Y: Check & Repair Cable connection Connector solder
  - N: Replace R/C

Check R/C Operating When turn off light in room

- Normal operating?:
  - Y: Close
  - N: Check & Replace Battery of R/C

If R/C operate, Explain the customer cause is interference from light in room.

- Normal operating?:
  - Y: Close
  - N: Replace R/C

Check 5v on Power B/D Replace Power B/D or Replace Main B/D (Power B/D don't have problem)

Check IR Output signal

- Normal Signal?:
  - Y: Normal
  - N: Replace Main B/D

Revised date: 10/13
STD. REPAIR PROCEDURE

**LCD TV**

**Error symptom**

**D. Function error**

<table>
<thead>
<tr>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010. 2.19</td>
<td>11/13</td>
</tr>
</tbody>
</table>

**External device recognition error**

- Check technical information
  - Fix information
  - S/W Version

- Technical information
  - N
    - Replace Main B/D
  - Y
    - External Input and Component Recognition error
    - RGB, HDMI, DVI, Optical Recognition error
      - Replace Main B/D
      - Fix in accordance with technical information

- Signal input?
  - Y
    - Check technical information
      - Fix information
      - S/W Version
  - N
    - Check and fix external device/cable
<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>E. Noise</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Circuit noise, mechanical noise</td>
<td></td>
<td>2010. 2.19</td>
<td>12/13</td>
</tr>
</tbody>
</table>

### Standard Repair Process

1. **Identify nose type**

2. **Circuit noise**
   - Check location of noise
   - OR
     - Replace PSU (with LED driver)
     - Replace LED driver

3. **Mechanical noise**
   - Check location of noise

   - Mechanical noise is a natural phenomenon, and apply the 1st level description. When the customer does not agree, apply the process by stage.
   - Describe the basis of the description in “Part related to nose” in the Owner’s Manual.

   - OR
     - When the noise is severe, replace the module (For models with fix information, upgrade the S/W or provide the description)
   - OR
     - If there is a “Tak Tak” noise from the cabinet, refer to the KMS fix information and then proceed as shown in the solution manual (For models without any fix information, provide the description)
Standard Repair Process

<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>F. Exterior defect</th>
<th>Established date</th>
<th>2010. 2.19</th>
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<td></td>
<td></td>
<td>Exterior defect</td>
<td>Revised date</td>
<td>13/13</td>
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</table>

- Zoom part with exterior damage
  - Module damage
    - Replace module
  - Cabinet damage
    - Replace cabinet
  - Remote controller damage
    - Replace remote controller
  - Stand dent
    - Replace stand
<table>
<thead>
<tr>
<th>No.</th>
<th>Error symptom</th>
<th>Content</th>
<th>Page</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>1</td>
<td>A. Video error_ No video/Normal audio</td>
<td>Check LCD back light with naked eye</td>
<td>A1</td>
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<tr>
<td>2</td>
<td></td>
<td>LED driver B+ 24V measuring method</td>
<td>A2</td>
<td></td>
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<tr>
<td>3</td>
<td></td>
<td>Check White Balance value</td>
<td>A3</td>
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<td>4</td>
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<td>A4</td>
<td></td>
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<td>5</td>
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<td>TUNER input signal strength checking method</td>
<td>A6</td>
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<td>LCD-TV Version checking method</td>
<td>A7</td>
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<td>7</td>
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<td>LCD TV connection diagram</td>
<td>A8</td>
<td></td>
</tr>
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<td>Tuner Checking Part</td>
<td>A9</td>
<td></td>
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<td>9</td>
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<td>Check Link Cable (LVDS) reconnection condition</td>
<td>A10</td>
<td>A10 : Edge LED</td>
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<td>A11 : Lamp</td>
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<td>Adjustment Test pattern - ADJ Key</td>
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<td>11</td>
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<td>A10</td>
<td>A10 : Edge LED</td>
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<td>A11 : Lamp</td>
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<td>A. Video error_Vertical/Horizontal bar, residual image, light spot</td>
<td>LCD TV connection diagram</td>
<td>A8</td>
<td></td>
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<tr>
<td>14</td>
<td></td>
<td>Check Link Cable (LVDS) reconnection condition</td>
<td>A10</td>
<td>A10 : Edge LED</td>
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<td>A11 : Lamp</td>
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<td></td>
<td>Adjustment Test pattern - ADJ Key</td>
<td>A12</td>
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</tr>
<tr>
<td>16</td>
<td></td>
<td>Exchange T-Con Board (1)</td>
<td>A-1/5</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>Exchange T-Con Board (2)</td>
<td>A-2/5</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Defected Type caused by T-Con/ Inverter/ Module</td>
<td>Exchange LED driver Board (PSU)</td>
<td>A-3/5</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td></td>
<td>Exchange Module itself (1)</td>
<td>A-4/5</td>
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<td>20</td>
<td></td>
<td>Exchange Module itself (2)</td>
<td>A-5/5</td>
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<Appendix>

Defected Type caused by T-Con/ Inverter/ Module

Continue to the next page
### Contents of LCD TV Standard Repair Process Detail Technical Manual

Continued from previous page

<table>
<thead>
<tr>
<th>No.</th>
<th>Error symptom</th>
<th>Content</th>
<th>Page</th>
<th>Remarks</th>
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</thead>
<tbody>
<tr>
<td>21</td>
<td>B. Power error_No power</td>
<td>Check front display LED</td>
<td>A17</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td></td>
<td>Check power input Voltage &amp; ST-BY 5V</td>
<td>A18</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td></td>
<td>Checking method when power is ON</td>
<td>A19</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
<td>POWER BOARD voltage measuring method</td>
<td>A4</td>
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<td>25</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>26</td>
<td>B. Power error_Off when on, off while viewing</td>
<td>POWER OFF MODE checking method</td>
<td>A22</td>
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</tr>
<tr>
<td>27</td>
<td>B. Power error_Off when on, off while viewing</td>
<td>POWER BOARD PIN voltage checking method</td>
<td>A19</td>
<td></td>
</tr>
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<td>28</td>
<td>C. Audio error_No audio/Normal video</td>
<td>Checking method in menu when there is no audio</td>
<td>A24</td>
<td></td>
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<tr>
<td>29</td>
<td>C. Audio error_Wrecked audio/discontinuation</td>
<td>Voltage and speaker checking method when there is no audio</td>
<td>A25</td>
<td></td>
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<td>30</td>
<td></td>
<td>Voltage and speaker checking method in case of audio error</td>
<td>A25</td>
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<tr>
<td>31</td>
<td>D. Function error_No response in remote controller, key error</td>
<td>Remote controller operation checking method</td>
<td>A27</td>
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### Standard Repair Process Detail Technical Manual

<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>A. Video error_No video/Normal audio</th>
<th>Established date</th>
<th>Revised date</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Check LCD back light with naked eye</td>
<td>2011. 2. 07</td>
<td>A1</td>
</tr>
</tbody>
</table>

**<ALL MODELS>**

After turning on the power and disassembling the case, check with the naked eye, whether you can see light from 4 locations.
A. Video error_No video/Normal audio

**Content**

- LED driver/lamp inverter
- B+ 24V measuring method

**Established date** 2011. 2. 07

**Revised date** A2

---

Check the DC 24V, 12V, 3.5V and Inverter on

* ALEF/OS 42/47/55"/60"*

<table>
<thead>
<tr>
<th>Pin</th>
<th>14 pin</th>
<th>14 pin</th>
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<tbody>
<tr>
<td>1-5</td>
<td>24V</td>
<td>24V</td>
</tr>
<tr>
<td>6-10</td>
<td>GND</td>
<td>GND</td>
</tr>
<tr>
<td>11</td>
<td>Detect</td>
<td>Detect</td>
</tr>
<tr>
<td>12</td>
<td>Inverter On/Off</td>
<td>Inverter On/Off</td>
</tr>
<tr>
<td>13</td>
<td>Int. PWM</td>
<td>Int. PWM</td>
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<tr>
<td>14</td>
<td>Ext. PWM (PDIM)</td>
<td>Ext. PWM (PDIM)</td>
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* ALL 32"/37"*

<table>
<thead>
<tr>
<th>Pin</th>
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<th>PSU</th>
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<tbody>
<tr>
<td>1-5</td>
<td>24V</td>
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</tr>
<tr>
<td>6-10</td>
<td>GND</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Detect</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Inverter On/Off</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Int. PWM</td>
<td></td>
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<tr>
<td>14</td>
<td>Ext. PWM (PDIM)</td>
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</table>

* 26" ~ 47" : '11 Pin map*

<table>
<thead>
<tr>
<th>Lamp (Power Board ↔ Inverter)</th>
<th>PSU</th>
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</thead>
<tbody>
<tr>
<td>14 Pin</td>
<td></td>
</tr>
<tr>
<td>1-5 24V</td>
<td></td>
</tr>
<tr>
<td>6-10 GND</td>
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<tr>
<td>11 Detect</td>
<td></td>
</tr>
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<td>12 Inverter On/Off</td>
<td></td>
</tr>
<tr>
<td>13 Int. PWM</td>
<td></td>
</tr>
<tr>
<td>14 Ext. PWM (PDIM)</td>
<td></td>
</tr>
</tbody>
</table>
### Entry method

1. Press the ADJ button on the remote controller for adjustment.

2. Enter into White Balance of item 7.

3. After recording the R, G, B (GAIN, Cut) value of Color Temp (Cool/Medium/Warm), re-enter the value after replacing the MAIN BOARD.
### Power Board voltage measuring method

- **Error symptom**: No video/ Audio

#### LCD TV

<table>
<thead>
<tr>
<th>Content</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Board voltage measuring method</td>
<td>2011. 2.07</td>
<td>A4</td>
</tr>
</tbody>
</table>

#### Error symptom:

- No video/ Audio

#### Content:

- Check the DC 20V or 24V, 12V, 3.5V.

#### 24 Pin (Power Board ↔ Main Board)

<table>
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<th>Function</th>
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<tr>
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<tr>
<td>2</td>
<td>20V (24V)</td>
</tr>
<tr>
<td>3</td>
<td>20V (24V)</td>
</tr>
<tr>
<td>4</td>
<td>20V (24V)</td>
</tr>
<tr>
<td>5</td>
<td>GND</td>
</tr>
<tr>
<td>6</td>
<td>GND</td>
</tr>
<tr>
<td>7</td>
<td>GND</td>
</tr>
<tr>
<td>8</td>
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</tr>
<tr>
<td>9</td>
<td>3.5V</td>
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<tr>
<td>10</td>
<td>3.5V</td>
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<td>11</td>
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<td>3.5V</td>
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<td>12V</td>
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<td>18</td>
<td>Inverter On/off</td>
</tr>
<tr>
<td>19</td>
<td>Lamp : A-Dim</td>
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<td>20</td>
<td>LED : N.C</td>
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<td>12V</td>
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<td>22</td>
<td>PWM Dim #1</td>
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<td>N.C</td>
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<td>Lamp : SCANNING Model : PWM Dim #2</td>
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#### 24 Pin (Power Board ↔ Main Board - FW20020-24SB (FOOSUNG))

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<td>20V (24V)</td>
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<td>3</td>
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<td>3.5V</td>
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<td>3.5V</td>
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<td>LED : N.C</td>
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<td>PWM Dim #1</td>
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<tr>
<td>24</td>
<td>Error-out</td>
</tr>
</tbody>
</table>
Standard Repair Process Detail Technical Manual

<ALL MODELS>

A. Video error_Video error, video lag/stop

TUNER input signal strength checking method

- Use the attenuator (-10dB, -15dB, -20dB etc.)

When the signal is strong, use the attenuator (-10dB, -15dB, -20dB etc.)

MENU -> red key(customer support) -> signal test
-> select channel
1. Checking method for remote controller for adjustment

Press the IN-START with the remote controller for adjustment.
As the part connecting to the external input, check the screen condition by signal.
### Standard Repair Process Detail Technical Manual

<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>A. Video error_Video error, video lag/stop</th>
<th>Established date</th>
<th>Revised date</th>
<th>Content</th>
<th>TUNER checking part</th>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<ALL MODELS>

![Image of circuit board]

**Checking method:**
1. Check the signal strength or check whether the screen is normal when the external device is connected.
2. After measuring each voltage from power supply, finally replace the MAIN BOARD.
## Standard Repair Process Detail Technical Manual

<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>A. Video error_Color error</th>
<th>Established date</th>
<th>Revised date</th>
<th>Content</th>
<th>Error symptom</th>
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<td></td>
<td>Check Link Cable (LVDS) reconnection condition</td>
<td>2011. 2.07</td>
<td>A10</td>
<td></td>
<td>&lt;LV**: Edge LED Series Models&gt;</td>
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Check the contact condition of the Link Cable, especially dust or mis insertion.
### Standard Repair Process Detail Technical Manual

<table>
<thead>
<tr>
<th></th>
<th>Error symptom</th>
<th>A. Video error_Color error</th>
<th>Established date</th>
<th>Revised date</th>
<th>Content</th>
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<td>Check Link Cable (LVDS) reconnection condition</td>
<td>2011. 2.07</td>
<td>A11</td>
<td></td>
</tr>
</tbody>
</table>

<LK** : Lamp series Models>

- Check the contact condition of the Link Cable

---

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### Standard Repair Process Detail Technical Manual

<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>A. Video error_Color error</th>
<th>Established date</th>
<th>Revised date</th>
<th>Content</th>
<th>Revised date</th>
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<tr>
<td></td>
<td></td>
<td>Adjustment Test pattern - ADJ Key</td>
<td>2011. 2.07</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

You can view 6 types of patterns using the ADJ Key:

- Checking item: 1. Defective pixel  
- 2. Residual image  
- 3. MODULE error (ADD-BAR, SCAN BAR..)  
- 4. Video error (Classification of MODULE or Main-B/D!)

---

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Appendix: Exchange T-Con Board (1)

- Solder defect, CNT Broken
- Solder defect, CNT Broken
- Solder defect, CNT Broken
- Solder defect, CNT Broken
- Solder defect, CNT Broken
- Solder defect, CNT Broken
- Solder defect, Short/Crack
- Solder defect, Short/Crack
- Abnormal Power Section
- Abnormal Power Section
- Abnormal Power Section
- Solder defect, Short/Crack
Appendix : Exchange T-Con Board (2)

Abnormal Power Section

Solder defect, Short/Crack

Fuse Open, Abnormal power section

Abnormal Display

GRADATION

Noise

GRADATION

Abnormal Power Section

Solder defect, Short/Crack

Abnormal Display
Appendix : Exchange PSU(LED driver)

No Light

Dim Light

No picture/Sound Ok
Appendix : Exchange the Module (1)

Panel Mura, Light leakage

Panel Mura, Light leakage

Press damage

Crosstalk

Press damage

Crosstalk

Press damage

Un-repairable Cases
In this case please exchange the module.
Appendix : Exchange the Module (2)

Un-repairable Cases
In this case please exchange the module.
**Error symptom**

**B. Power error _No power**

**Established date**: 2010. 2 .19

---

<table>
<thead>
<tr>
<th>Content</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check front display LED</td>
<td>A17</td>
</tr>
</tbody>
</table>

---

- Image shown may differ from your TV.


- Remote control and intelligent sensors
- Power Indicator (Can be adjusted using the Power indicator in the OPTION menu.)

**Front LED control:**
- Menu → Option → Power Indicator → Standby light ON

**ST-BY condition:** Red

**Power ON condition:** White

---

**No.** | **Description**
---|---
1 | USB input
2 | PCMCIA Card Slot
3 | HDMI IN (Except for 32/42LV34**)
4 | Headphone Socket (Except for 32/42LV34**)

---

**Button** | **Description**
---|---
↑  ↓  ▼  ▲ | Scrolls through the saved programmes
-  +  | Adjusts the volume level
OK | Selects the highlighted menu option or confirms an input
HOME | Accesses the main menus, or saves your input and exits the menus
INPUT | Changes the input source
ST | Turns the power on or off

---

1. Intelligent sensor - Adjusts the image quality corresponding to the surrounding environment.
2. Touch Button - You can use the desired button functions by touching.

---

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A17
For '11 models, there is no voltage out for st-by purpose. When st-by, only 3.5V is normally on.

Check the 3.5V when st-by
B. Power error _No power

Checking method when power is ON

<table>
<thead>
<tr>
<th>Error symptom</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCD TV</td>
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</table>

24 Pin (Power Board ↔ Main Board) - 영동

<table>
<thead>
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<th>Pin</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Power on</td>
</tr>
<tr>
<td>2</td>
<td>20V (24V)</td>
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<tr>
<td>3</td>
<td>20V (24V)</td>
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<td>GND</td>
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<td>5</td>
<td>GND</td>
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<td>GND</td>
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<tr>
<td>7</td>
<td>3.5V</td>
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<td>9</td>
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<td>12</td>
<td>GND</td>
</tr>
<tr>
<td>13</td>
<td>GND</td>
</tr>
<tr>
<td>14</td>
<td>GND</td>
</tr>
<tr>
<td>15</td>
<td>GND</td>
</tr>
<tr>
<td>16</td>
<td>N.C</td>
</tr>
<tr>
<td>17</td>
<td>12V</td>
</tr>
<tr>
<td>18</td>
<td>Inverter On/off</td>
</tr>
<tr>
<td>19</td>
<td>12V</td>
</tr>
<tr>
<td>20</td>
<td>Lamp : A-Dim</td>
</tr>
<tr>
<td>21</td>
<td>12V</td>
</tr>
<tr>
<td>22</td>
<td>PWM Dim #1</td>
</tr>
<tr>
<td>23</td>
<td>N.C</td>
</tr>
</tbody>
</table>

Check “power on” pin is high

Edge LED PSU without LED Driver

Lamp PSU without inverter

24 Pin (Power Board ↔ Main Board) - FOOSUNG

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Power on</td>
</tr>
<tr>
<td>2</td>
<td>20V (24V)</td>
</tr>
<tr>
<td>3</td>
<td>20V (24V)</td>
</tr>
<tr>
<td>4</td>
<td>GND</td>
</tr>
<tr>
<td>5</td>
<td>GND</td>
</tr>
<tr>
<td>6</td>
<td>GND</td>
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<td>7</td>
<td>GND</td>
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<tr>
<td>8</td>
<td>GND</td>
</tr>
<tr>
<td>9</td>
<td>3.5V</td>
</tr>
<tr>
<td>10</td>
<td>3.5V</td>
</tr>
<tr>
<td>11</td>
<td>3.5V</td>
</tr>
<tr>
<td>12</td>
<td>3.5V</td>
</tr>
<tr>
<td>13</td>
<td>GND</td>
</tr>
<tr>
<td>14</td>
<td>GND</td>
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</tr>
</tbody>
</table>

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Only for training and service purposes
## Entry method

1. Press the IN-START button of the remote controller for adjustment

2. Check the entry into adjustment item 3
### Error symptom
<table>
<thead>
<tr>
<th>Error symptom</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Audio error_No audio/Normal video</td>
<td>Checking method in menu when there is no audio</td>
</tr>
</tbody>
</table>

### Checking method
1. Press the MENU button on the remote controller
2. Select the AUDIO function of the Menu
3. Select TV Speaker from Off to On
Checking order when there is no audio

① Check the contact condition of 20V or 24V connector of Main Board

② Measure the 24V input voltage supplied from Power Board
   (If there is no input voltage, remove and check the connector)

③ Connect the tester RX1 to the speaker terminal and if you hear the Chik Chik sound when you touch the GND and output terminal, the speaker is normal.
Remote controller operation checking method

D. Function error_ No response in remote controller, key error

Established date: 2011. 2 .07

<ALL MODELS>

Checking order

1. 2. Check IR cable condition between IR & Main board.
3. Check the s-by 3.3V on the terminal 6.
4. When checking the Pre-Amp when the power is in ON condition, it is normal when the Analog Tester needle moves slowly, and defective when it does not move at all.